

Raman-active gold nanoparticles as beacons in cervical cancer cells

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Nanoparticles can be utilized to overcome the undesired side effects that occur with current chemotherapeutic treatments by delivering the drug directly to the tumor site. Raman-active gold nanoparticles (RA-AuNPs) can be used as biotags to deliver and track the nanosystem throughout cervical cancer cells by exploiting surface-enhanced Raman spectroscopic (SERS) effects.¹ We propose a nanosystem design containing a gold nanosphere core along with a SERS reporter (2-cyano-2-hexanoic acid) and polyethylene glycol (PEG) modification. The SERS reporter behaves as a beacon by enhancing the Raman signal while the PEG modifications provide minimal cytotoxicity². Thus, SERS coupled with optical microscopy allows us to detect and monitor RA-AuNPs capable of delivering chemotherapeutic agents.

The RA-AuNPs were incubated in cervical cancer cells at various concentrations and times to study the induced biochemical changes. Data are presented using multivariate data analysis techniques, namely vertex component analysis (VCA)³, to demonstrate the uptake of the nanoparticles and their distribution within the cells.

References

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